The GEON LiDAR Workflow as a Distribution Pathway for the B4 LiDAR Dataset

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The recently acquired Southern San Andreas and San Jacinto Faults LiDAR dataset (known as the “B4 Project”) represents the cutting edge for LiDAR technology in terms of geodetic accuracy and spatial resolution. The nearly 1000 kilometers of data covering these important fault systems has already proven to be an indispensable resource for earthquake studies. Furthermore, the B4 data acquisition has set the standard by which future earth science LiDAR data acquisitions will be judged. For example, the forthcoming GeoEarthScope LiDAR topography acquisition is modeled after the B4 Project, using many of the same methods and data processing approaches.

The unprecedented volume of data generated by the B4 acquisition has demonstrated that access and processing of these data can be a significant barrier to community use of the data. The problem of community access will be significantly magnified by the forthcoming GeoEarthScope LiDAR acquisition effort because the data volume is anticipated to be at least five times those of the B4 dataset.

In order to address the challenges posed by the distribution and processing of community LiDAR datasets, we have applied a geoinformatics approach capitalizing on cyberinfrastructure developed by the GEON project (http://www.geongrid.org). The internet-based resource we have developed, the GEON LiDAR Workflow (GLW) (http://lidar.asu.edu/glw.html), is designed to democratize access to these challenging datasets and provides tools to enable users to perform basic processing (e.g. digital elevation model (DEM) generation) on the data. As a proof of concept, we have made four community LiDAR datasets available via the GLW, with the B4 dataset as the largest and most frequently accessed. Our approach utilizes a comprehensive workflow-based solution which begins with user-defined selection of a subset of point data from an internet-based portal and ends with download and visualization of DEMs and derived products. This approach allows users to carry out computationally intensive LiDAR data processing without having appropriate resources locally.

With the expectation of GeoEarthScope LiDAR datasets being delivered via the GLW, we are currently in the process of improving system stability, documentation and portal usability, adding processing capacity, and providing new job monitoring and job archiving capability. The inclusion of the B4 dataset in the GLW at the proof of concept stage has enabled us to test the GLW on a dataset that closely resembles these forthcoming data while simultaneously providing the earthquake science community access to these data.
Furthermore, the distribution of B4 LiDAR topography via the GLW represents an excellent example of the utilization of cyberinfrastructure to facilitate access to cutting edge and computationally challenging community datasets.

REFERENCES:


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